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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Mikhail Lyakh

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INTEL CORPORATION

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EXAMINER

GIDADO, RASHEED

ART UNIT

PAPER NUMBER

2464

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/588,950	Applicant(s) LYAKH ET AL.	
	Examiner RASHEED GIDADO	Art Unit 2464	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 June 2010.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,5,6,8,12,13,15,19,20,22,26 and 27 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,5,6,8,12,13,15,19,20,22,26 and 27 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. The amendment filed on 06/23/2010 has been entered. Claims 1, 5-6, 8, 12-13, 15, 19-20, 22 and 26-27 are still pending in this application, while claims 2-4, 7, 9-11, 14, 16-18, 21, 23-25 and 28 have been cancelled.

Response to Arguments

2. Applicant's arguments filed June 23, 2010 have been fully considered but they are not persuasive. The rejection has been modified to address the amendments to the claims as provided by the applicant.

Regarding claims 1, 8, 15 and 22, the applicant's argued on page 10 of the response that, Kowalski does not teach "using predetermined modulation patterns to perform ABL technique", the examiner respectfully disagrees with the applicant argument. Kowalski discloses adaptive bit loading technique using predetermined and determined ABL patterns (see Kowalski, Abstract, ¶ 0009, ¶ 0010, ¶ 0011, ¶ 0013, ¶ 0025: ABL technique using codeword that represent predetermined level of modulation for the carrier. The predetermined modulation is based on codeword in a codebook). Kowalski also teaches using limited modulation patterns by disclosing using vector-quantization-based technique for achieving ABL map compression in order to reduce computation complexity which will increase operation efficiency (see Kowalski, ¶ 0009, ¶ 0010 and ¶ 0025).

Applicant's also argued that Kowalski fails to teach "wherein said N_{BL} patterns are stored a-priori and said number of allowed patterns is limited to some set of N_{BL} patterns which is less than N_{mod}^{NSC} patterns with N_{NSC} being the number of subcarriers in an OFDM", the examiner respectfully disagrees with the applicant argument. Kowalski discloses ABL technique for achieving ABL map compression by performing computation for optimizing carrier signal constellation through ABL (see Kowalski, ¶ 0010, ¶ 0011, ¶ 0013, ¶ 0021, ¶ 0025-0027). Kowalski ABL technique performs computation to compress the ABL patterns in order to reduce computation complexity, which is exactly what the claimed invention is doing.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 15 and 19-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claim 15, the amended claim recites "**a computer readable medium encoded with computer executable instructions...**" in lines 1-2. The original

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specification does not disclose the newly added limitation “a computer readable medium encoded with computer executable instructions”. The original specification and original claim 15 recites “**A machine accessible medium that provides instructions....**”

Nowhere in the original specification recites “a computer program code instruction is stored in a computer readable medium” or “a computer readable medium encoded with computer executable instructions”. Thus, it is clear that the newly added claim limitations contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Regarding claims 19 and 20, they also disclose “a computer readable medium encoded with computer executable instructions”, and thus they are also rejected for the same reasons as set forth in claim 15.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1, 5-6, 8, 12-13, 15, 19-20, 22 and 26-27 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 1, 8, 15 and 22; the “N_{mod}” recited in various part of the claims is vague and unclear since the N is not defined in any part of the claim. N_{SC} is

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defined as the number of subcarriers in an OFDM, but " N_{mod} " is not defined and this makes the claims to be unclear and indefinite. The N in " N_{mod} " is not defined by the claim, and one of ordinary skill in the art would not be reasonably apprised of the scope of the invention.

Claims 5-6, 12-13, 19-20 and 26-27 are also rejected since they depend on rejected claims 1, 8, 15 and 22 as set forth above.

Claim Rejections - 35 USC § 101

7. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

8. Claims 15 and 19-20 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Regarding claim 15, the claim is directed to non-statutory subject matter. The claim recited computer readable medium, and the computer readable medium is disclosed in the specification as covering transitory signal per se (see Applicant Publication ¶ 0009 and ¶ 0010: computer readable media can be any other type of media). During patent examination the pending claims must be interpreted as broadly as their terms reasonably allow See *In re Zletz*, 893 F.2d 319 (Fed. Cir. 1989). The broadest reasonable interpretation of a claim drawn to computer readable medium typically covers forms of non-transitory tangible media and transitory propagating

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signals per se in view of ordinary and customary meaning of computer readable media.

See MPEP 2111.01 and *In re Nuijten*, 500 F.3d 1346, 1356-57 (Fed. Cir. 2007)

(transitory embodiments are not directed to statutory subject matter).

A claim drawn to such a computer readable medium that covers both transitory and non-transitory embodiments may be amended to narrow the claim to cover only statutory embodiments to avoid a rejection under 35 U.S.C. 101 by adding the limitation “non-transitory” to the claim.

Regarding claims 19 and 20, none of the claims dependent on claim 15 corrects the deficiencies as stated above; therefore, the dependent claims are also directed to non-statutory subject matter.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claims 1, 5-6, 8, 12-13, 15, 19-20, 22 and 26-27 rejected under 35 U.S.C. 103(a) as being unpatentable over US Pub. 2005/0195905 to John Kowalski (hereafter referenced as Kowalski).

Regarding claim 1, Kowalski discloses an apparatus, comprising:

a wireless station (Fig 2 Data Transmitter 201, Data Receiver 202) operable in a wireless network (§ 0005: OFDM wireless LAN system) using an adaptive bitloading (ABL) technique (see abstract, § 0005, § 0009 and § 0020: using adaptive bitloading technique), wherein said wireless station is capable of using a predetermined limited set of modulation patterns to perform said ABL (see Kowalski, Abstract, § 0009, § 0010, § 0011, § 0013, § 0025: ABL technique using codeword that represent predetermined level of modulation for the carrier. The predetermined modulation is based on codeword in a codebook). Kowalski also teaches using limited modulation patterns by disclosing

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using vector-quantization-based technique for achieving ABL map compression in order to reduce computation complexity which will increase operation efficiency (see Kowalski, ¶ 0009, ¶ 0010 and ¶ 0025) **and**

*wherein said N_{BL} patterns are stored a-priori (Fig 2 Blocks 207/208; ¶ 0020, ¶ 0025-0027: allowable modulation patterns are known from two codebooks) **and***

said number of allowed patterns is limited to some set of N_{BL} patterns which is less than N_{mod}^{NSC} patterns with N_{SC} being the number of subcarriers in an OFDM symbol is implicitly disclosed in Kowalski as ABL map compression using a vector quantization-based technique to perform a nearest neighbor match based on representation vector and minimization of selected metric (see Kowalski, ¶ 0010, ¶ 0011, ¶ 0013, ¶ 0021, ¶ 0025-0027: Kowalski discloses ABL technique for achieving ABL map compression by performing computation for optimizing carrier signal constellation through ABL. Kowalski ABL technique performs computation to compress the ABL patterns in order to reduce computation complexity, which is exactly what the claimed invention is doing). It would have been obvious to one of ordinary skill in the art at the time of the invention based as common knowledge in the art to understand that performing nearest neighbor match and performing computation to compress ABL patterns as disclosed by Kowalski, which implies reducing number of allowable patterns must be reduced for compression to take place is the same as limiting modulation patterns with respect to theoretical maximum as disclosed in the invention. The motivation for doing so is a design choice to reduce system overhead by reducing implementation complexity (see Kowalski, ¶ 0008, ¶ ¶ 0019 and ¶ 0025).

Regarding claim 5, Kowalski discloses the apparatus further comprising at least one additional wireless station that is capable of receiving packets from said wireless station and upon packet reception of said packets by said at least one additional wireless station, said at least one additional wireless station determines which of said N_{BL} patterns is best for current channel conditions and sends back to said wireless station an index of a pattern instead of said pattern itself (see ¶ 0020 and ¶ 0025-0027).

Regarding claim 6, Kowalski discloses the apparatus wherein said wireless station uses said pattern index to obtain said bitloading pattern, modulate data with said pattern, and send data to said at least one additional wireless station advanced by said bitloading pattern index (see ¶ 0027).

Regarding claim 8, it is rejected for the same reasons as set forth in claim 1.

Regarding claim 12, it is rejected for the same reasons as set forth in claim 5.

Regarding claim 13, it is rejected for the same reasons as set forth in claim 6.

Regarding claim 15, it is rejected for the same reasons as set forth in claim 1.

Regarding claim 19, it is rejected for the same reasons as set forth in claim 5.

Regarding claim 20, it is rejected for the same reasons as set forth in claim 6.

Regarding claim 22, it is rejected for the same reasons as set forth in claim 1.

Regarding claim 26, it is rejected for the same reasons as set forth in claim 5.

Regarding claim 27, it is rejected for the same reasons as set forth in claim 6.

Conclusion

13. **Examiner's Note:** Examiner has cited particular columns and line numbers in the references applied to the claims above for the convenience of the applicant. Although the specified citations are representative of the teachings of the art and are applied to specific limitations within the individual claim, other passages and figures may apply as well. It is respectfully requested from the applicant in preparing responses, to fully consider the references in their entirety as potentially teaching all or part of the claimed invention, as well as the context of the passage as taught by the prior art or disclosed by the Examiner.

In the case of amending the claimed invention, Applicant is respectfully requested to indicate the portion(s) of the specification which dictate(s) the structure relied on for proper interpretation and also to verify and ascertain the metes and bounds of the claimed invention.

14. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to RASHEED GIDADO whose telephone number is (571)270-7645. The examiner can normally be reached on Monday to Thursday 9:00-5PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky Ngo can be reached on 571-272-3139. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ricky Ngo/
Supervisory Patent Examiner, Art Unit 2464

RASHEED GIDADO
Examiner
Art Unit 2464